

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Creation of Low	)	
Power Radio Service	)	MM Docket No. 99-25
	)	
	)	RM-9208
	)	RM9242

**Petition for Reconsideration**

**INTRODUCTION**

This petition for reconsideration is filed by Lohnes and Culver, Consulting radio engineers practicing before the Federal Communications Commission (FCC). It is filed in the interest of potential LPFM broadcasters to allow for practical engineering latitude for efficient LPFM service. It requests reconsideration of limited technical aspects in the Report and Order adopted January 20, 2000 in the above referenced matter. The reconsideration is requested to clarify certain technical aspects of the Report and Order and to remove over-restrictive, or to reconcile self-contradictory technical aspects of the proposed new FCC Rules.

The item for which reconsideration is requested is listed and discussed below.

**DIRECTIONAL ANTENNAS**

The technical transmission tool, the use of directional antennas, was discussed in the R&O at paragraph 108 and is included in the proposed new rules at new Section 73.816 of the Rules.

Paragraph 108 of the R&O states the following. (foot notes have been omitted)

108. *Directional antennas.* Under our current rules, full service FM stations may specify

directional antennas to avoid interference to other stations. Such facilities are subject to several strict installation and pattern requirements. Processing these applications is staff intensive. Construction permits for directional facilities generally contain numerous conditions. **Since we are relying on a minimum distance separation methodology — rather than a contour-based approach — to provide interference protection, we see no need for stations to employ directional antennas.** Accordingly, to simplify applicant requirements and facilitate application processing and ensure that service can be implemented as expeditiously as possible, we will not authorize directional antennas for LPFM stations. (Emphasis added)

Section 73.816 of the Rules states;

73.816 Antennas.

(A) Directional antennas will not be authorized in the LPFM service.

## ANALYSIS

Lohnes and Culver agrees with the decision to allocate and locate LPFM stations based on a mileage separation basis. However, the blanket prohibition on the use for directional antennas as stated above, over-restricts an otherwise useful engineering tool of broadcasters.

By allocating and locating an LPFM facility by mileage separation, the station will be free to radiate a signal up to the maximum allowed combination of Effective Radiated Power (ERP) and antenna Height Above Average Terrain (HAAT) for the LPFM class chosen. Any restriction of radiated power, in any direction, will improve protection over and above the required mileage separation. Nearby stations can not be harmed, but only helped, by any reduction of signal by use of a directional antenna, or by any other means within the Rules such as using less ERP and antenna height than allowed for the LPFM class authorized.

Service to the community chosen by the LPFM station licensee is the primary goal. It will be met by the licensee who uses sufficient service facilities - it is in the best interest to adequately serve the community. It is also in the best interest to have the ability to provide efficient service and coverage so as to not waste transmitter power over un-desired or un-populated areas. It may be in

the technical interest of the broadcaster to also restrict the signal radiated toward areas in which self interference may be created, for example where multiple reflected or purposefully transmitted signals may conflict. For example public safety radio service coverage up and down a road would best be served by two relatively small directional antennas mounted back to back at a low height along side the road. Coverage down a side road, with a different audio message, but carried on the same frequency, may be possible using another directional antenna at right angles to the main road coverage. The receiver co-channel capture effect will allow transition between the two messages after a small "message border" area of self interference

Reduction of costs, improved efficiency and minimizing environmental and area impact by minimizing antenna height can also be accomplished by the use of directional antennas. An antenna with a significant gain in one direction down a road can be accomplished using a relatively small Yagi or Log-Periodic antenna. An omni-directional antenna with similar gain may be very tall, 50 feet or more for a vertical gain of approximately 6. Using an antenna that is nearly as long as the maximum allocated LPFM antenna height, to serve a circular area when only a limited area is populated or desires coverage, is not efficient use of the radio spectrum.

## **CONCLUSION**

Lohnes and Culver respectfully request reconsideration of the total prohibition on the use of directional antennas contained in the LPFM Rules of the FCC. The reason for the prohibition, the use of directional antennas for contour protection, is not allowed by the LPFM Rules and therefore the prohibition is redundant and overly restrictive of this useful engineering option.

Respectively Submitted,  
Lohnes and Culver  
February 23, 2000

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